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ABSTRACT

Sex discrimination in education has been prohibited by federal legislation since Title IX of the Education Amendments of 1972 was signed into law. Title IX and other federal legislation have increased women's access to education, yet sex differences in educational preparation and occupational choice persist. This issues brief discusses various theories about the causes of sex differences in academic performance, reviews recent research on sex differences in classroom interaction, and suggests ways to change stubborn patterns of sex discrimination. A resource list is provided. (DB)

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Equitable Treatment of Girls and Boys in the Classroom

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AMERICAN ASSOCIATION

OF UNIVERSITY WOMEN

June 1992

Equitable Treatment of Girls and Boys in the Classroom

THE MORE THINGS CHANGE

The major federal statute prohibiting sex discrimination in education, Title IX of the Education Amendments of 1972, was signed into law more than 15 years ago. In following years, Congress authorized funding for model sex equity programs through the Women's Educational Equity Act (WEEA, 1974) and required states to work to eliminate sex bias from their vocational education programs (1976).

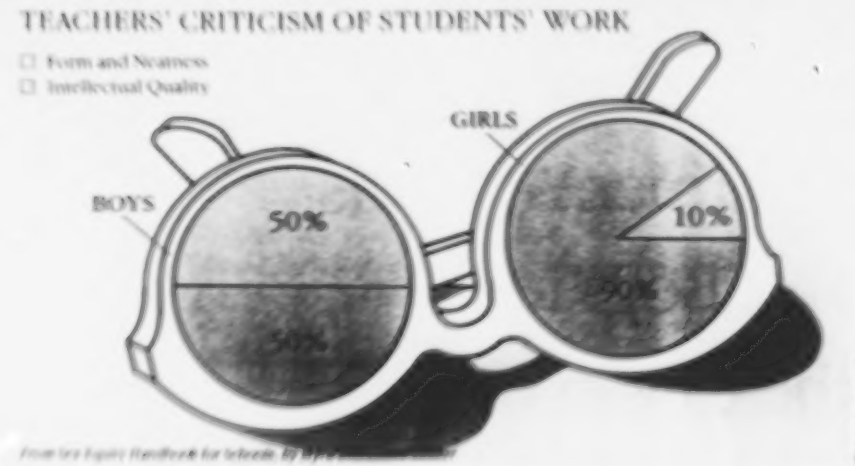
Women's education advocates anticipated that these programs would encourage both girls and boys to explore nontraditional fields and place a high priority on school performance and career preparation. They foresaw that the range of occupations considered appropriate for both sexes would be broadened and that, as a result, occupational sex segregation would decline and the pay gap between men and women would narrow in the long run.

Although Title IX has increased women's access to education and many excellent model programs have been created under WEEA and the Vocational Education Act, sex differences in educational preparation and occupational choice persist. For example, even though all vocational programs must now be open to both sexes, 70 percent of all girls in vocational high schools study traditionally female fields.[1] And while women made up 53 percent of all college students by

1987, they still received less than 15 percent of all engineering degrees.[2]

The limited impact of the educational equity programs begun in the 1970s has been due largely to inadequate funding and lack of enforcement, particularly after the U.S. Supreme Court's ruling in *Grove City College* v. *Bell* in 1984 limited the application of Title IX to specific programs.[3] But perhaps a major factor in blunting their impact are girls' everyday interactions with teachers and other students in the classroom. Too often, classroom dynamics are laced with unconscious sex stereotyping, as when teachers spend more time with boys in math classes and more time with girls in reading classes. Such subtle but powerful messages have been shown to circumscribe girls' and women's choices regarding academic preparation, achievement, and careers.

In the past two years, AAUW and the AAUW Educational Foundation have launched twin initiatives—*Choices for Tomorrow's Women* and the Eleanor Roosevelt Fund for Women and Girls' Intergenerational Partnerships, respectively—to address the ways women and girls make choices about education, family life, and careers (see "What We Can Do," page 5). This brief, an introductory instrument of those efforts, discusses various theories about the causes of sex differences in academic performance, reviews recent research on sex differences in classroom interaction, and suggests ways to change stubborn patterns of sex discrimination.



From Sex Equity Handbook for Schools, by Myra Sadker and David Sadker

GIRLS, BOYS, AND BRAINS

Extensive research shows that girls and boys perform differently on most standardized academic tests. In the U.S. administration of the Second International Science Study test in 1983, for instance, fifth grade boys scored 6.2 percent higher than the girls. Similarly, in the 1981-82 National Assessment of Educational Progress high school girls scored higher in reading, but lower in math and science, than boys.[3]

The test results don't tell us why such differences exist; they could be caused by differential ability, preparation, motivation, or expectations about the probability of success. Theories attempting to explain academic performance differences between girls and boys can be divided roughly into two categories: biological and sociological.

Some researchers have suggested that differences in intellectual functioning are caused by inherited, sex-linked genes or by the effect of sex-linked hormones on brain development before birth and at puberty. Although links have been shown between hormones and brain development, no link to intelligence has been proven. Similarly, there is no physical evidence that intelligence genes exist, whether sex-linked or not. Studies claiming to establish such a biological link typically hypothesize cause based on correlation.

For instance, a much-publicized 1980 study by Camilla Benbow and Julian Stanley was widely reported as proving the existence of "male" math genes. During a Johns Hopkins University study, groups of mathematically gifted junior-high students were administered the math sections of the Scholastic Aptitude Test. The boys in the study consistently outscored the girls and Benbow and Stanley argued that, since all students take the same sequence of math courses from elementary through junior high school, the difference must be due largely to inherited ability.

But critics were quick to point out that Benbow and Stanley had ignored the informal ways boys and girls learn about math, and had assumed that their experiences with math in the classroom were the same. Other researchers in the same study had investigated the students' backgrounds and found that the boys' parents gave them more encouragement and more math- and science-related toys.[4]

A boy took some playdough in a pot to the stove, and announced he was cooking. 'Daddies don't cook,' two little girls told him. He backed away, saying, 'My puppy cooks . . .' and looking uncertain. The teacher there told the two girls that daddies sometimes do cook. The boy immediately returned to the stove and started cooking.[5]

One difficulty with research of this sort is finding a measure that will distinguish learned skills from innate ability. In 1974, psychologists Eleanor Maccoby and Carol Jacklin surveyed this research and concluded that while girls showed slightly more verbal ability, boys had more quantitative and spatial-visualization abilities.[6] But a 1981 study by Janet Hyde pointed out that although those differences were present in the studies reviewed, their magnitude was very small. Sex accounted for less than 5 percent of the differences between boys and girls in verbal, quantitative, and spatial-visualization abilities.[7] In other words, the variation between individuals of either sex is greater than that between the sexes.

Other researchers suggest that gender-role socialization accounts for most of the differences between girls' and boys' academic performance. Gender roles are the range of activities, attitudes, and emotions considered socially appropriate for men and women, and they are learned through interactions with parents, peers, teachers, and other adults, as well as from the print and electronic media. Although children acquire extensive knowledge of gender roles, there are great differences in the extent to which individuals internalize and act out those roles as a part of their identity (masculinity or femininity). One study of math achievement, for instance, found that for students who had enrolled in the same sequence of math courses the difference between girls' and boys' performance on achievement tests was very small; it disappeared altogether when sociocultural factors like parents' attitudes toward the subject and participation in math-related activities—such as building things—were taken into account.[8]

Research suggests that gender-role socialization mediates intellectual achievement in several ways:

- *Children learn from parents, teachers, and peers that some activities are inappropriate for their gender, and so they do not consider achievement in those areas possible or desirable. Research shows that parents typically believe that boys do better than girls in advanced math and that they attribute boys' successes in math to talent, but girls' to effort.*
- Some of the psychological traits that are differentially acquired during gender-role socialization may be helpful for certain types of learning. In science education, for instance, it is important to explore, to learn by experience, and to take risks—behaviors that are more encouraged in boys than girls.
- Because they are differently socialized, boys and girls follow a different pattern of intellectual development and develop different learning styles, so they respond differently to the same classroom climate. For example, various studies have shown that girls respond better to a cooperative, rather than a competitive, classroom environment, perhaps because their moral development focuses on what psychologist Carol Gilligan calls the "ethic of care."[9]
- Some researchers suggest that these differences are so deeply entrenched that they amount to different sex-role cultures.[10]

Research has also shown that ideas about appropriate gender roles vary between cultures. A 1987 study revealed that girls scored higher than boys in math achievement tests in Hawaii, for instance. The results were most pronounced for Japanese-American, Filipino-American, and native Hawaiian students, suggesting that math achievement is not seen as inimical to the feminine role in those cultures.[11] Other studies found that Asian-American girls receive more parental encouragement and less negative male peer pressure about preparing for math and science careers.[12]

Different cultures may also produce different learning styles. In Asian-American cultures, for instance, it is typically assumed that everyone can learn if they

work hard enough. Lack of "natural" ability is not an acceptable excuse for failure. Other researchers have suggested that low-income and minority cultures stress group interaction and cooperation more than white middle-class cultures, which tend to stress individualism and competition.[13] This puts minority girls at a double disadvantage in the classroom.

TEACHING THE HIDDEN CURRICULUM

Research conducted in the past decade has shown that the structure of lessons and the dynamics of classroom interaction all too often create an environment alien, if not hostile, to girls (again, doubly so for girls from certain ethnic groups and social classes). Patterns of differential treatment sometimes are so deeply ingrained that even teachers who strive to be fair and impartial are not aware of all of them. And even when treatment is identical, there may be a negative impact on girls because they may experience it differently than boys.

Schoolrooms Particularly at the preschool and kindergarten level, rooms often are arranged into highly gender-stereotyped play areas, such as a cooking corner for girls and a building blocks corner for boys. This both reinforces the idea that such activities are incompatible and makes crossing over to "gender-inappropriate" activities more difficult.[14]

Teacher-student interaction The interaction between teachers and students is interladen with subtle messages that affect girls' self-esteem and sense of identity. Research shows that

- minority students of both sexes receive less attention from the teacher, which decreases self-esteem.[15]
- teachers believe that the ideal pupil is orderly, conforming, and dependent, traits that are also identified with the "feminine" gender role. At first glance, this would seem to work to the advantage of female students. In fact, it works against them because teachers tend to give less attention to those they think are ideal pupils. Also, teachers' positive reinforcement of this identification discourages girls from more active, assertive learning styles that tend to get students farther in the long run.[16] (See chart on page 5.)
- boys who do not conform to the ideal pupil role are disciplined, but girls are ignored; this means boys get yet more attention when they misbehave.[17] When both boys and girls are misbehaving, teachers are three times as likely to discipline the boys; this conveys that boys are more important even though the context is negative.[18] This pattern holds true across racial and ethnic lines. (See chart on page 4.)
- teachers initiate 10 percent more communication with boys in the classroom, again strengthening their sense of dominance and importance.[19]
- teachers ask boys more complex, abstract, and open-ended questions, which provide better opportunities for active learning.[20]
- regarding class projects and assignments, teachers are more likely to give detailed instructions to boys and more likely to take over and finish the task for girls, again depriving them of active learning.[21]
- teachers spend more time with girls in reading classes and more time with boys in math classes.[22]
- ninety percent of the praise for boys' schoolwork is directed at the intellectual content and quality of their work, rather than form or neatness, compared to 80 percent for girls.[23]
- nearly 90 percent of the criticism of girls' schoolwork is directed at the intellectual content and quality of their work, compared to 50 percent for boys.[24] (See chart on page 2.)
- when teachers criticize boys, they often tell them that their failings are due to lack of effort. Girls are not given this message; the absence of which implies that effort would not improve their results.[25]

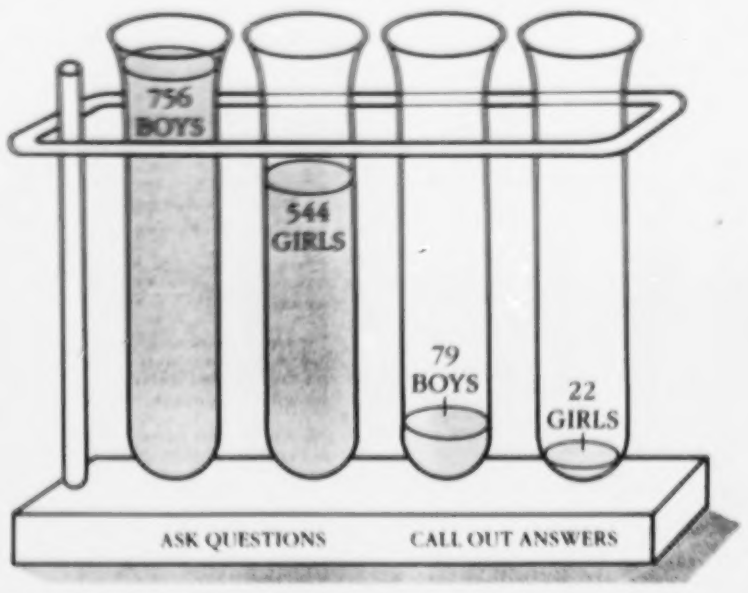
Student-student interaction The social relationships between students—patterns of work and play that reflect their understanding of appropriate and desirable behavior—are typically much more gender-stereotyped than teacher-student relationships. Students' social relationships often reinforce the messages that girls are less capable and have fewer career choices than boys. Research shows that

- *classroom interaction between boys and girls is highly infrequent from preschool through junior high school; thus, stereotypes about sex-segregated activities are reinforced.*[26]
- *during high school, girls typically increase their motivation to form relationships and decrease their motivation to achieve academically, which affects crucial education and career choices they make at that time.*[27]
- when classes are divided into groups by ability, boys with high math achievement scores are more likely than girls with similar scores to be assigned to the high-ability group.[28]
- within math groups, girls who ask questions of their peers are answered only by other girls; boys who ask questions are answered by both boys and girls.[29]
- when boys and girls work together on science projects, girls spend four times as much time watching and listening, and 25 percent less time manipulating the equipment involved, than boys.[30]

This web of relationships, reflecting unconscious and largely unexamined

A 1987 study revealed that girls scored higher than boys in math achievement tests in Hawaii. The results were most pronounced for Japanese-American, Filipino-American, and native Hawaiian students, suggesting that math achievement is not seen as inimical to the feminine role in those cultures.[31]

INTERACTIONS IN AN EIGHTH-GRADE SCIENCE CLASS



From "Listening to Adolescents: Gender Differences in Science Classroom Interaction" by Linda Morse and Herbert Handley, in Gender Influences in Classroom Interaction, Louise Cherry Wilkinson and Cora B. Marrett, eds.

assumptions about the different capabilities and appropriate roles of men and women, has been called the "hidden curriculum."

LIFELONG LESSONS

The hidden curriculum encourages boys to be more autonomous, to find out things for themselves, and to develop their own abilities and resources. On the other hand, it encourages girls to be more dependent, to wait to hear answers rather than discover them, and to rely on the teacher for guidance. These patterns have far-reaching consequences. (See chart on page 5.)

Self-esteem One result of these patterns is that girls are much more likely to believe that lack of ability causes inadequacies in their school performance, while boys are more likely to believe lack of effort causes their failures. Whereas effort is something a child can control, ability is seen as immutable. Thus, girls' self-esteem and motivation to succeed are undercut.

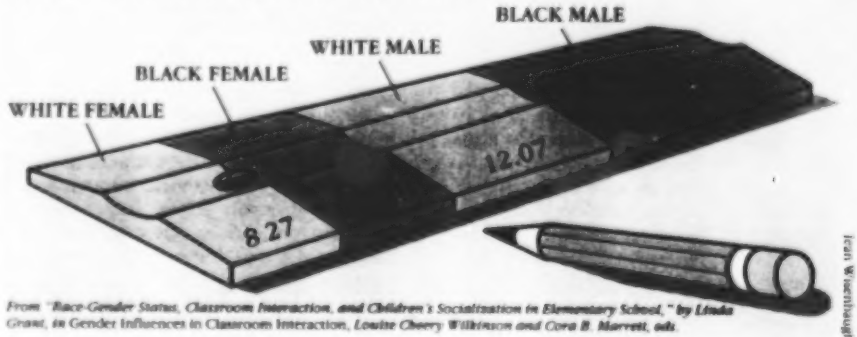
Girls are particularly likely to believe that they lack ability in areas stereotyped as more appropriate for boys. Girls tend to attribute failures in math and science tasks to lack of ability, for instance, while attributing failures in language arts to inadequate effort.[51]

Independence Girls do not have as much opportunity to work independently as boys do, and therefore lose the chance to develop habits and skills critical to academic and professional success: taking the initiative, problem-solving, taking risks, persisting despite setbacks, manipulating tools and equipment, and leading groups. These habits and skills are particularly important for science careers.

The children were making paper baskets; the handles had to be stapled in place. The teacher moved around the room, showing the boys how to use the stapler and holding the handle while the boys used the stapler. When the girls asked for assistance, the teacher took the basket and stapled it for them.[45]

Achievement motivation Girls' interest in higher education and nontraditional careers peaks when they are 13 years old. Throughout high school, boys' ambitions steadily increase while girls' decline.[52] Research suggests that the motivation to achieve depends at least partly on an expectation of success. The low self-esteem created when girls believe they are less able than boys, particularly in male-dominated fields, also reduces their motivation to succeed. In addition, girls recognize that lingering sex discrimination in higher education and the workplace means that the cost of success will be higher for them, which further reduces the incentive to try.[53]

AVERAGE REPRIMANDS RECEIVED BY STUDENTS IN ONE ELEMENTARY CLASSROOM



Jean Wentzlaff

From "Race-Gender Status, Classroom Interaction, and Children's Socialization in Elementary School," by Linda Grant, in Gender Influences in Classroom Interaction, Louise Cherry Wilkinson and Cora B. Marrett, eds.

Occupational choices Children learn occupational segregation as young as two or three, and these ideas are continuously reinforced by schoolbooks and the media, as well as by teachers' expectations and patterns of interaction at school.[54] By high school, girls' career choices are highly sex-segregated compared with boys'.[55] Because female-dominated occupations are typically paid much less than male-dominated ones, this pattern of occupational choice contributes to the cycle of poverty for women.

REWRITING THE SCRIPT

Guaranteeing access to education and employment is not enough to end gender stereotyping and provide girls with opportunities for success. The subtle, discouraging messages girls receive everyday about their roles and potential choices must be changed to ones of possibility and achievement. This is especially true for minority and immigrant girls, who will be 29 percent of the new workers in the work force between now and the year 2000.[56]

To foster girls' self-confidence and serious consideration of a range of career choices, parents need to encourage their daughters to be independent, to explore, and to experiment—even if it means they will occasionally get dirty or hurt. Girls need to be provided with toys such as building blocks, erector sets, and chemistry sets, which encourage facility with spatial relationships and mechanics, as well as with traditional girls' toys.

Schools must provide equal access to all resources for girls and boys. This may involve rearranging classrooms, placing, for example, building blocks and cooking toys in the same area. It also means providing a variety of role models in everything from faculty and staff hiring to textbook selection to the designation of speakers at assemblies.

Schools can also provide special programs to help girls make wise choices. The Hispanic Mother-Daughter Program at Arizona State University in Tempe, Arizona, for instance, brings mothers and daughters together for visits to local colleges and universities, classroom exercises in career choices, and presentations by professionals from the community.

Teachers can help by providing opportunities in class lessons and discussions for girls and boys to learn to identify gender-role stereotypes and how those stereotypes limit their lives. Teachers can also thwart the informal structures of sex segregation by encouraging girls to play with equipment that is *de facto* reserved for boys, and vice versa.

Structuring group projects in ways that ensure girls an equal opportunity to participate is another way teachers can defeat the insidious effects of the hidden curriculum. Although boys typically dominate mixed-sex groups, research has shown that when teachers are trained to set up equitable group projects, girls and boys spend roughly equal amounts of time actively engaged in manipulating the equipment involved.[57]

Researchers have suggested that girls might do better work in classrooms that use cooperative learning techniques, particularly in math.[58] In cooperative learning, students are divided into small groups that work together on a particular subject. Individual students are tested regularly, and groups compete for prizes based on overall group improvement.[59]

Teachers also need to be trained to be sensitive to girls' special needs regarding conflicts between "appropriate" gender roles and wise career choices. Minority and immigrant girls may be struggling with other cultural norms as well. In addition, teachers must learn to praise and criticize the same behaviors by girls and boys consistently, and encourage girls to develop intellectual independence. Such habits and skills can be developed through in-service training such as the Gender-Ethnic Expectations and Student Achievement program initiated in 1984 by the Los Angeles, California, school system. This program trains selected teachers in equity concepts and strategies for overcoming bias in the classroom and sends them back to their school districts as peer trainers for other teachers.

Training in equitable teaching techniques should be included in every teacher education program and required for certification, but many schools of education have dropped sex equity from their agendas. One good resource in this area is the *Sex Equity Handbook for Schools*, a textbook on non-sexist teaching (see "Resources" on page 6). The handbook was published under the aegis of the Non-Sexist Teacher Education Project, which was funded under the WEEA in 1978–79 to develop teacher education materials on sex-equitable treatment.

WHAT WE CAN DO

Help to ensure our daughters' futures by joining in these recent AAUW initiatives.

Choices for Tomorrow's Women aims to empower women and girls to make appropriate life choices. Under *Choices for Tomorrow's Women*, AAUW branches and divisions across the country are working with broad coalitions of allies to break down the institutional barriers that limit the choices of women and girls and provide second chances when inadequate choices were made the first time around.

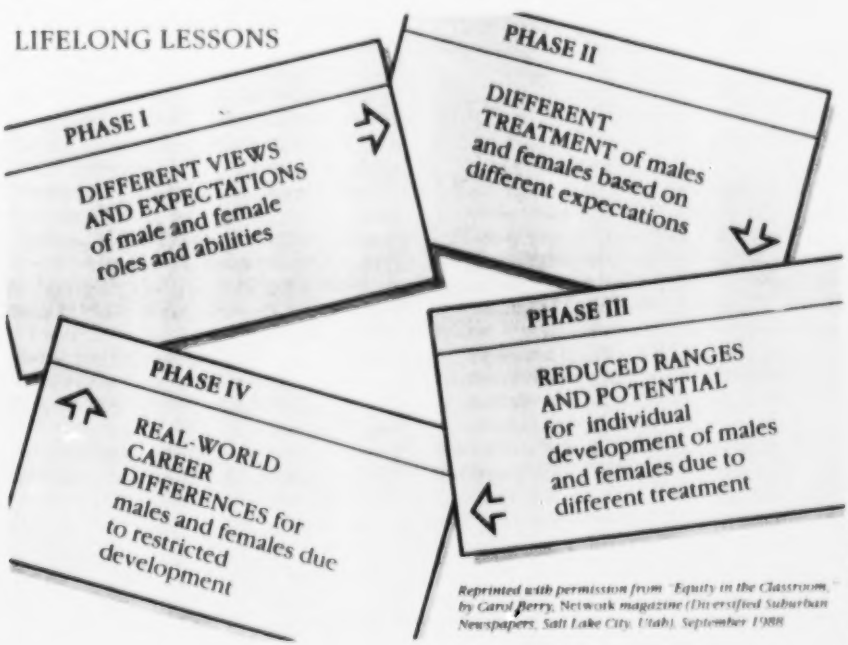
The AAUW Educational Foundation's **Eleanor Roosevelt Fund for Women and Girls: Intergenerational Partnerships** was established to encourage original research and action to eliminate barriers to girls' and women's participation in education, promote the value of diversity and cross-cultural communication, and gain and disseminate a greater understanding of how women and girls think, learn, work, and play. As its first action project, the fund is sponsoring Teacher Enrichment Sabbaticals that will provide elementary and secondary school teachers the opportunity to improve their effectiveness with at-risk girls and with girls in math and science courses. Within a couple of years, AAUW branches and divisions will be helping to put research conducted under the fund's auspices into practice in schools in their communities.

Within these initiatives you can

- plan a branch program on changing the patterns of differential treatment of girls and boys in the classroom. Invite teachers, administrators, school board members, professors from schools of education, and/or students to participate in the meeting.
- build broad coalitions—including AAUW college/university member institutions that conduct teacher training and/or pedagogical research—in your community around issues of equal access and treatment in education. Use this brief as an initial resource.
- present information on these issues at a Parent-Teacher Association (PTA) meeting. A student-teacher forum on differential treatment in the classroom is one way to approach the subject.
- present information on these issues to the school board, and ask to work with them on strategies for attacking the problem.
- support the Fund for Women and Girls and encourage teachers in your community to apply for a Teacher Enrichment Sabbatical (for application information, please contact the Fund for Women and Girls, AAUW Educational Foundation, address below; 202/728-7603).
- sponsor a conference or workshop—for teachers, students, or the entire community—presenting research on differential treatment in the classroom, especially that conducted by Fund for Women and Girls sabbatical research awardees. Invite local university and public school faculty as speakers.
- donate materials on gender-role stereotyping and sex bias—including this brief—to the schools for use in curriculum development and the classroom. Provide training materials in sex-equitable teaching techniques to your school system (see "Resources" on page 6).
- present awards to teachers who use sex-equitable teaching techniques.

During a first-grade testing period, each child was instructed to find the correct page in a seven-page testing booklet and fold the booklet back so only that page showed. When girls who had finished the task saw classmates who were having trouble doing it, they got up, did the task for them, and sat back down. No boys offered to help another child, and no one thanked the girls for their help.[44]

- work to have sex-equitable teaching techniques added to the curriculum of your *alma mater* and teacher training institutions in your area and to requirements for teacher certification in your state. Contact your state board of education for information on those requirements and how they may be changed.
- seek support for your efforts by applying for an AAUW Educational Foundation Research & Projects (R&P) Grant. Funding available for 1989–90 includes Issue Focus Grants for projects emphasizing math and science enrichment for girls, mentoring for girls and women, or parenting and family education. For application information, please contact R&P Grants, AAUW Educational Foundation, address below; 202/728-7609. (Please note that not all of the ideas listed above are necessarily R&P Grant-eligible activities.)
- apply for a WEEA project grant from the U.S. Department of Education. This grants program aims to promote equity for girls and women at all levels of education, preschool through adult. The 28 projects funded this year include efforts to develop and evaluate educational materials, establish model programs for educational personnel, perform research and development activities, and provide guidance and counseling services. Contact your state board of education for further information.
- support funding for WEEA, which must be appropriated by the U.S. Congress annually. To keep informed of federal action, subscribe to *Action Alert*, AAUW's legislative newsletter ($20/AAUW members, $25/nonmembers; send check or money order to *Action Alert* Subscription, address below).


LIFELONG LESSONS
PHASE I
DIFFERENT VIEWS AND EXPECTATIONS of male and female roles and abilities
PHASE II
DIFFERENT TREATMENT of males and females based on different expectations
PHASE III
REDUCED RANGES AND POTENTIAL for individual development of males and females due to different treatment
PHASE IV
REAL-WORLD CAREER DIFFERENCES for males and females due to restricted development

Reprinted with permission from "Equity in the Classroom," by Carol Berry, Network magazine (Diversified Suburban Newspapers, Salt Lake City, Utah), September 1988.

In one science class, children were divided into groups to work on constructing an electrical switch. When some of the girls had difficulty assembling their equipment, the teacher repeatedly told them to 'go and ask the boys for help.' [45]

A DIFFERENT EQUITY

In a pluralistic society such as ours there are many different cultures—defined by intersections of gender, class, ethnicity, location, and other affiliations—which foster different learning styles. Too often, classrooms and teaching techniques are geared to meet the strengths of only one learning style; the learning styles of boys are accommodated over those of girls, just as the intellectual habits of some cultural minorities are catered to more than others by our schools.

Already, 45 percent of our work force is female, including 51 percent of mothers of children under the age of 3.[40] And by 2020, almost 40 percent of our citizens will be minorities.[41] Clearly, the future of the United States will rest largely on our ability to create learning environments that provide equal encouragement, resources, and opportunities to girls and boys from all backgrounds.

FOOTNOTES

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RESOURCES

Classroom Climate Issues Packet, including *The Classroom Climate: A Chilly One for Women?*; *Selected Activities Using "The Classroom Climate: A Chilly One for Women?"*; *Out of the Classroom: A Chilly Campus Climate for Women?* ($7 from the Project on the Status and Education of Women, Association of American Colleges, 1818 R Street, N.W., Washington DC 20009, 202/387-1300), 1982–84.

***Learning Her Place—Sex Bias in the Elementary School Classroom* ($4 from the Project on Equal Education Rights, 1333 H Street, N.W., 11th Floor, Washington, DC 20005; 202/682-0940), 1985.**

***Promoting Self-Esteem in Young Women: A Manual for Teachers* (single copies free from the University of the State of New York, State Education Department, Division of Civil Rights and Intercultural Relations, Albany, NY), 1988.**

***Resources for Educational Equity, 1988* (free from the Women's Educational Equity Act Publishing Center, Educational Development Center, 55 Chapel Street, Suite 200, Newton, Massachusetts 02160; 1-800/225-3088, customer service), 1988.**

***Sex Equity Handbook for Schools*, by Myra and David Sadker (New York: Longman, 1982).**

***Teachers Make the Difference: An Introduction to Education* (New York: Harper and Row, 1980). (One of the few teacher training textbooks that deals with sex-equitable treatment in the classroom.)**

***Title IX: A Practical Guide to Achieving Sex Equity in Education* ($3 from the National Coalition for Women and Girls in Education, c/o National Women's Law Center, 1616 P Street, N.W., Washington, DC 20036), 1988.**

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